Deploying Xserve

Session 621

Deploying Xserve

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Introduction

Increasing focus on IT infrastructure

- Operational costs are under scrutiny
- Availability of service has never been as great
- Deployment time is shorter
- Systems per administrator increasing
- Server utilization higher

Introduction
Apple's IT value proposition

- Operational costs are under scrutiny
- Availability of service has never been as great
- Deployment time is shorter
- Systems per administrator increasing
- Server utilization higher

- Lower cost of deployment and licensing
- Reliability and availability
- Ease of deployment
- Ease of management
- Power, flexibility, lower cost

What You'll Learn

- Why Xserve?
- Speeds and feeds (architecture review)
- Deployment
  - Hardware
  - Software
- Backup strategies
- Resources

Why Xserve?

The easiest way to deliver powerful network services

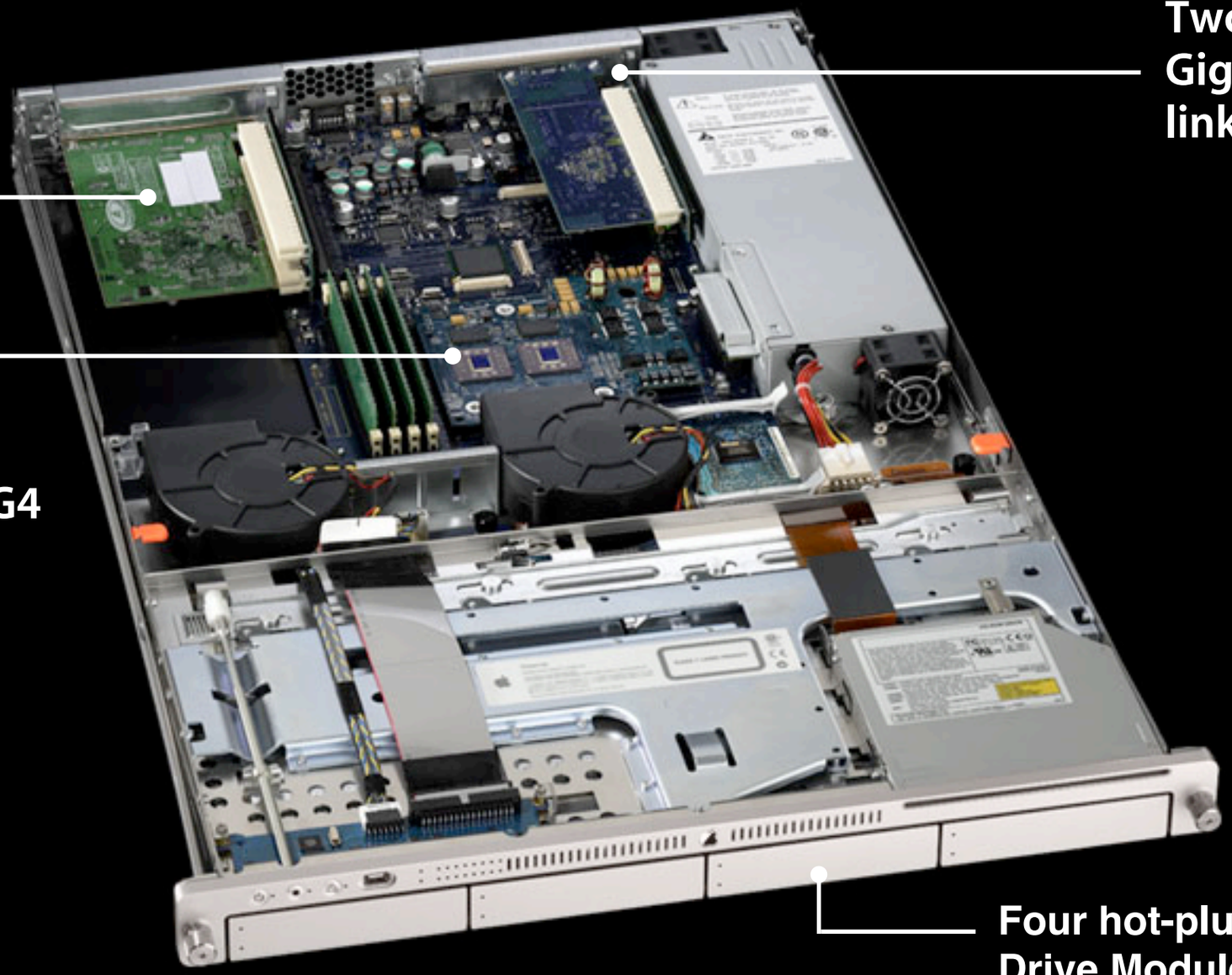
- High-density, rack-optimized design
- Affordable, scalable storage
- Industrial-strength, UNIX-based operating system
- Powerful open standards-based services
- Deliver more capabilities with less cost

Designed for the Data Center

Performance and capacity in a 1U enclosure

Designed for the Data Center

G4 processing power • Ultrafast I/O • Massive storage



Two independent Gigabit Ethernet links

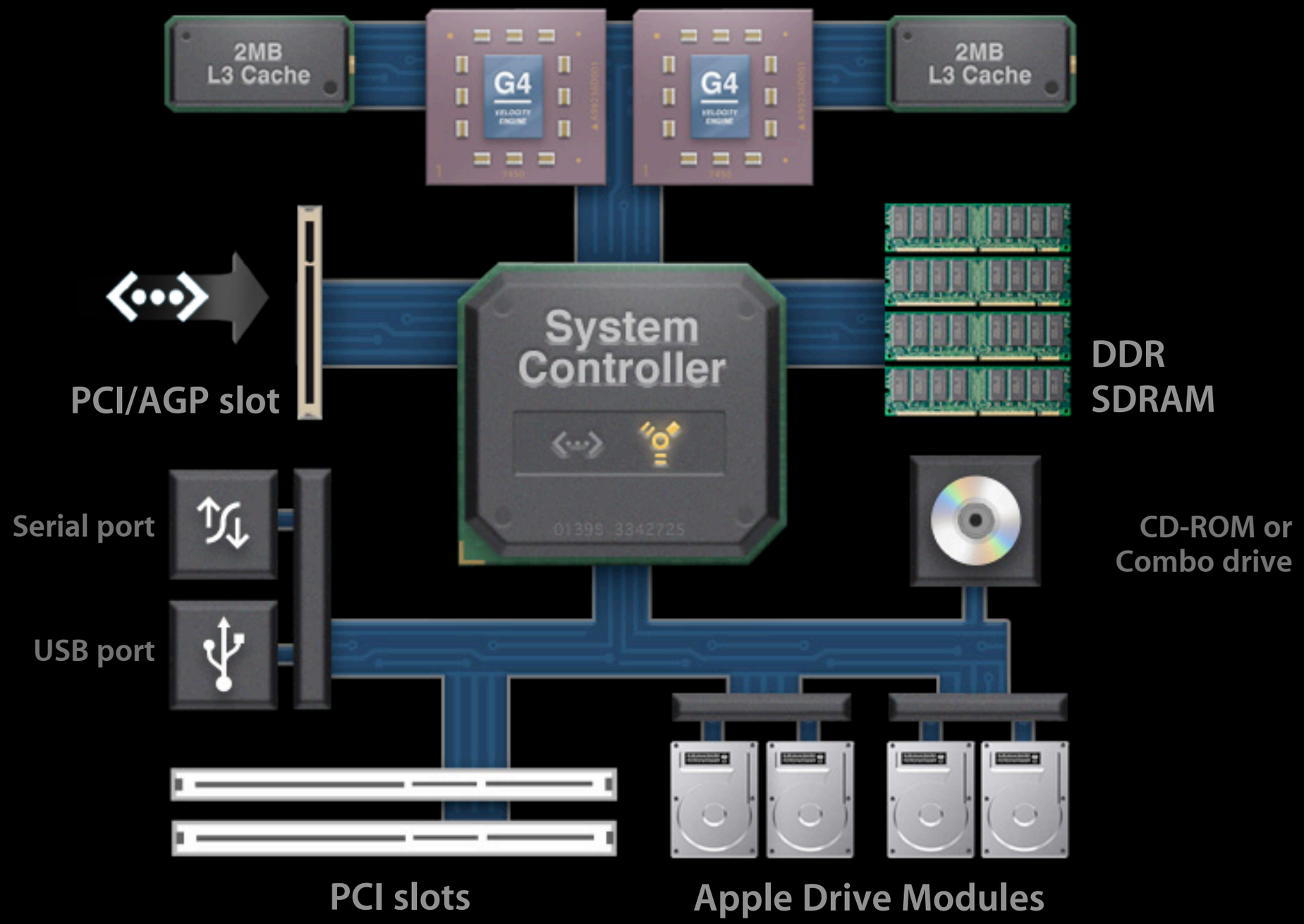
Two high-speed 64-bit, 66MHz PCI slots

Single or Dual G4 Processors

Four hot-plug Apple Drive Modules for up to 720GB internal storage

Server Optimized

Powerful architecture designed for server performance



Easy-to-Access Components

Designed for serviceability

- Entire unit glides out on rails for easy access
- All components user serviceable—in seconds

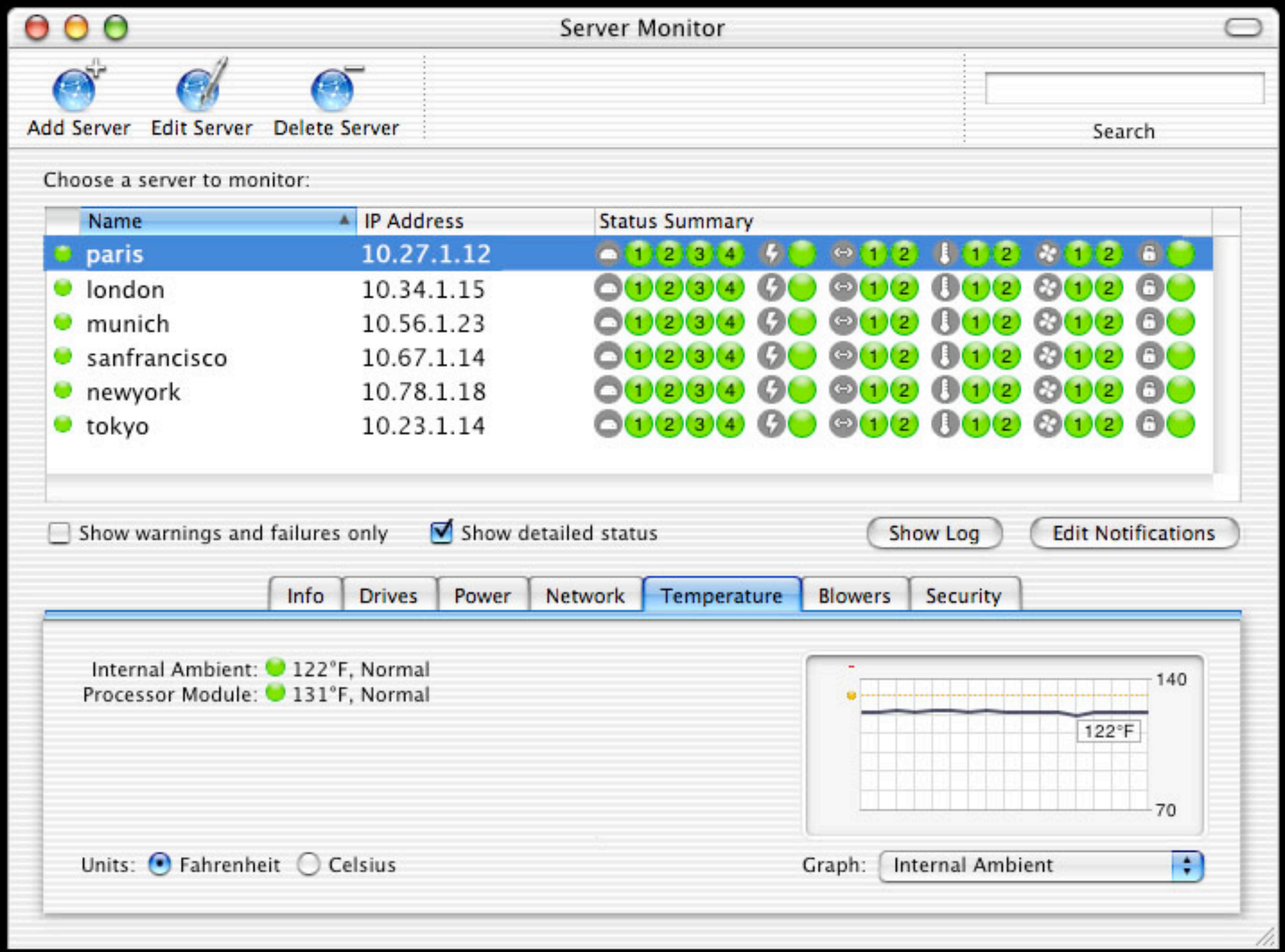
Hardware Monitoring

Remote monitoring of Xserve hardware subsystems

- Power supply, blowers, temperature sensors, Ethernet and drive module status and health
- SMART support for pre-failure notification
- Provides system information to Server Monitor
  - E-mail notifications
  - Remote system identification

Server Monitor

Remote monitoring of Xserve hardware subsystems



Xserve Configurations

1 or 2 processors
4 drive bays—up to 720GB storage
Dual gigabit Ethernet

CD-ROM or combo drive
VGA Video
Mac OS X Server Unlimited

2 processors
1 drive bay with 60GB ADM
On-board gigabit Ethernet

No optical drive
No video
Mac OS X Server 10-user license

Mac OS X Server

Powerful network services

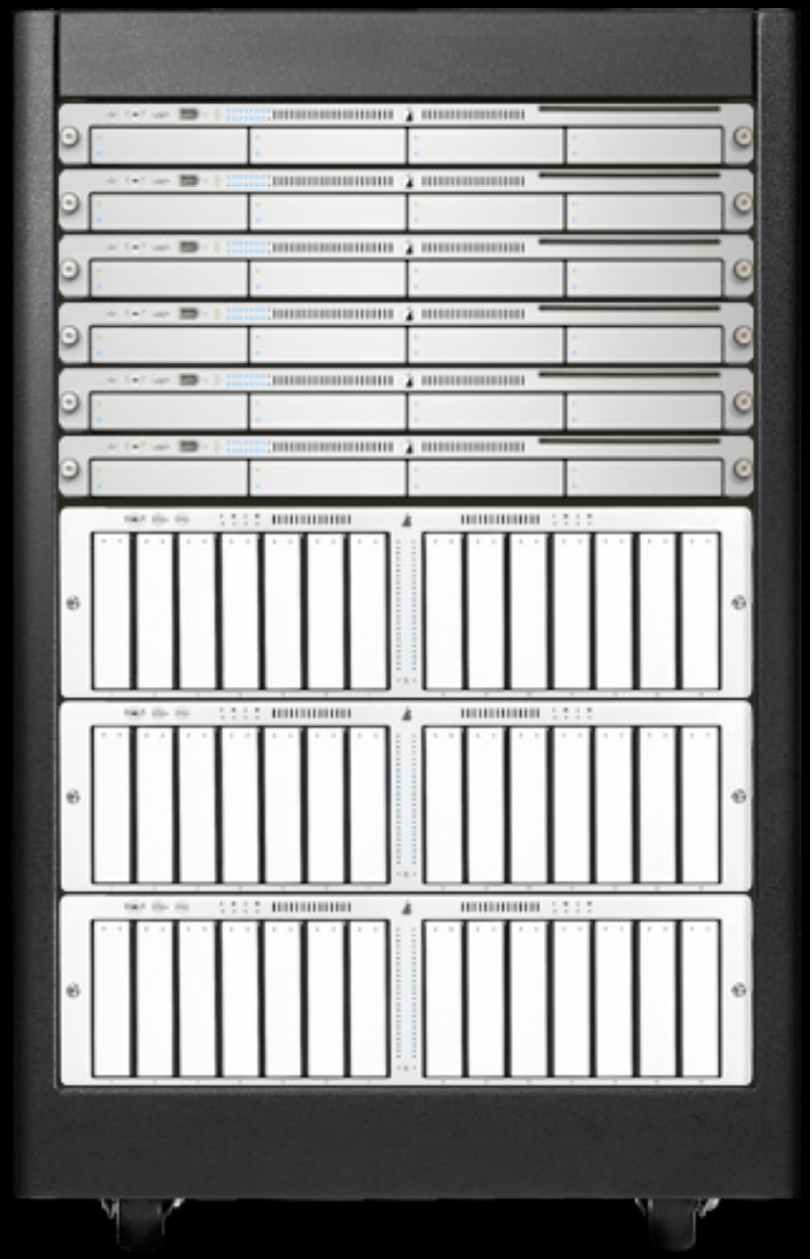
- Cross-platform file and printer sharing
- Web and e-mail services
- Media streaming
- Directory services
- Macintosh desktop management
- Networking and security

Deployment

- Rack
- Power
- Networking
- Software installation and management
- IP Failover
- Backup
- Beyond the GUI—essential Mac OS X command-line tools

Deployment
Racks

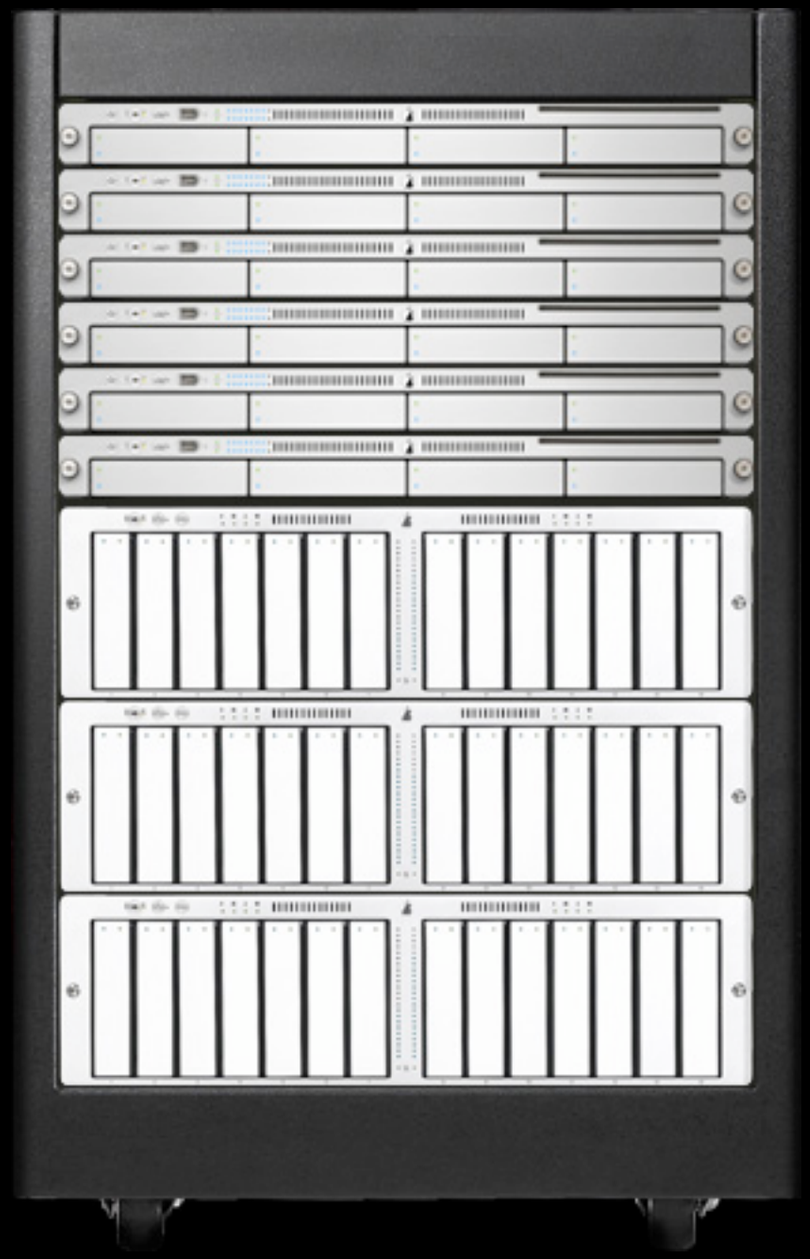
- Xserve supports:
  - 2 post telecom racks (center mounted)
  - 4 post racks and cabinets, 30” or greater deep
  - 24” or 26” deep AV rack (extends out back)
- Mounting hardware included
  - Caged nuts, M5 & 10/32” screws, brackets



Deployment

Racks

- Tips:
  - Xserve RAID requires 4 post rack
  - Mount bottom to top
  - Use provided guide when tightening front screws
  - With slot-load Xserves, keep CD protector on until installed in rack



Deployment

Power and environmentals

Xserve Uni Processor	Xserve Dual Processor
Rated 3.6A @ 345W Typically 94-190W 321- 639 BTU/h	Rated 3.6A @ 345W Typically 134-244W 459-833 BTU/h

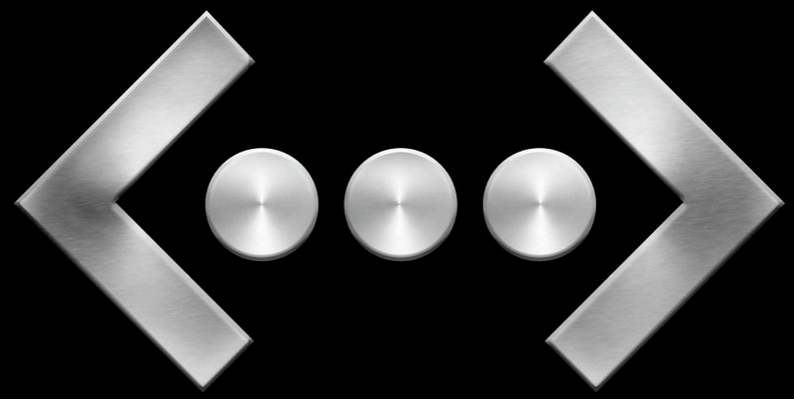
See Apple Knowledge Base article #86251 for details

Deployment
Power and UPS

- APC 1000RM1U UPS will provide:
  - ~30 minutes of power to a single Xserve
  - ~15 minutes of power to a fully loaded Xserve
- APC 3000RM3U UPS will provide
  - ~15 minutes of power to 6 Xserves
  - ~5 minutes of power to 6 fully loaded Xserves

Deployment
Networking

- Dual copper gigabit Ethernet built-in standard configurations
  - Must be on separate subnets
  - PCI Ethernet card supports jumbo frames up to 9000 MTU
- Optical Ethernet cards available from third parties
- IP over FireWire
  - Available in Mac OS X Server v10.2.4 or later



Deployment
Networking

- SNMP
  - Installed on Jaguar Server
  - To activate, edit `/etc/hostconfig`

```
SNMPSERVER=-YES-
```

  - Run `snmpconf` for configuration (location, contact, etc.)
  - For more information
    - `man snmpd`
    - http://www.net-snmp.com

Deployment
Software installation

- Installation methods
  - Locally with CD, keyboard, mouse and monitor
    - On server itself
    - From another host, using FireWire Target Disk Mode
  - Remotely with CDs and Server Assistant
  - Network install
  - Clone a system disk using asr

Deployment

Front panel boot menu

1: “C”—Boot from CD	5: “T”—Begin FireWire target disk mode
2: “N”—Boot from network (NetBoot)	6: “Command-Option-P-R”—Reset NVRAM
3: “D”—Boot from internal drive (scans L to R)	7: “Command-Option-O-F”—Enter Open Firmware (via serial port if no USB keyboard connected)
4: “Comand-Shift-Optional-Delete”—Boot from other than startup disk (FireWire)	

Deployment
Software installation

- Locally with CDs, keyboard, mouse and video
  - From server: works just as expected!
  - From another (Mac OS X, Mac OS X Server) host
    - Put Xserve into FireWire TDM
    - Install to Xserve like a target volume

Deployment
Software installation

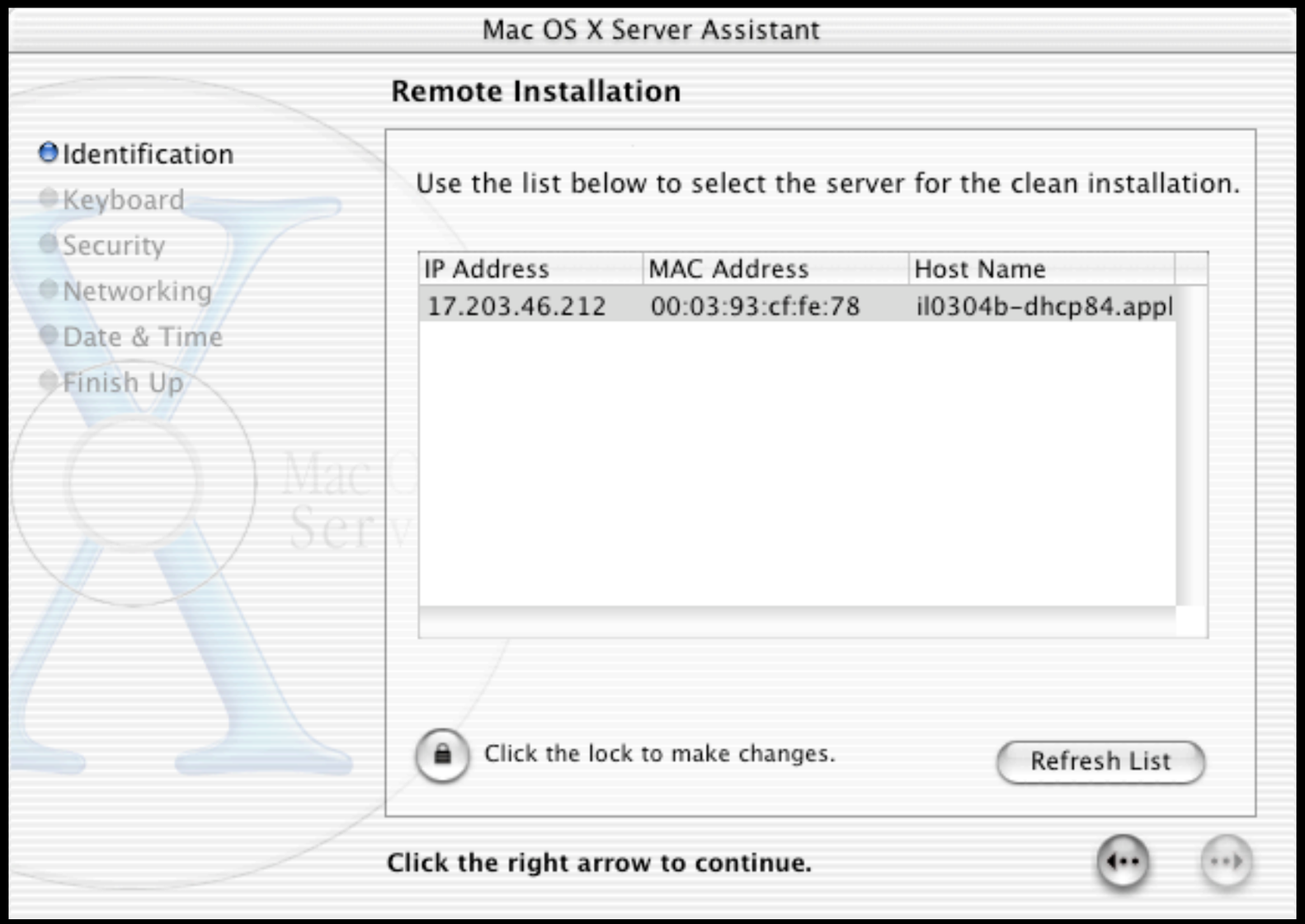
- Remotely with CDs and Server Assistant
  - Boot server from CD
  - Run Server Assistant from remote client
  - Select remote Xserve
  - Authenticate using first 8 digits of serial number of Xserve
  - Continue through Assistant

Remote Server Assistant

Task selection

Remote Server Assistant

Server selection

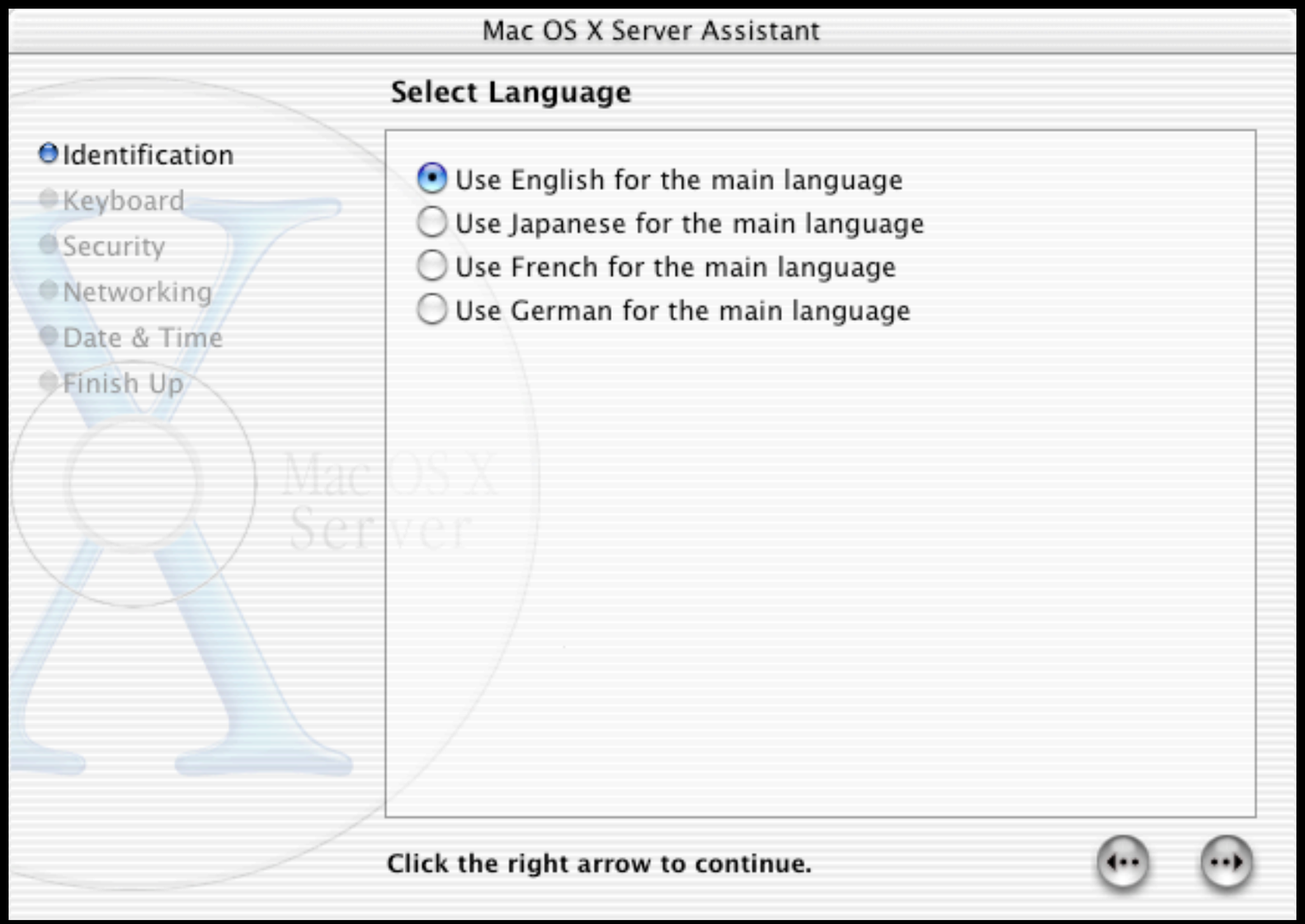


Remote Server Assistant

Authentication

Remote Server Assistant

Install assistant

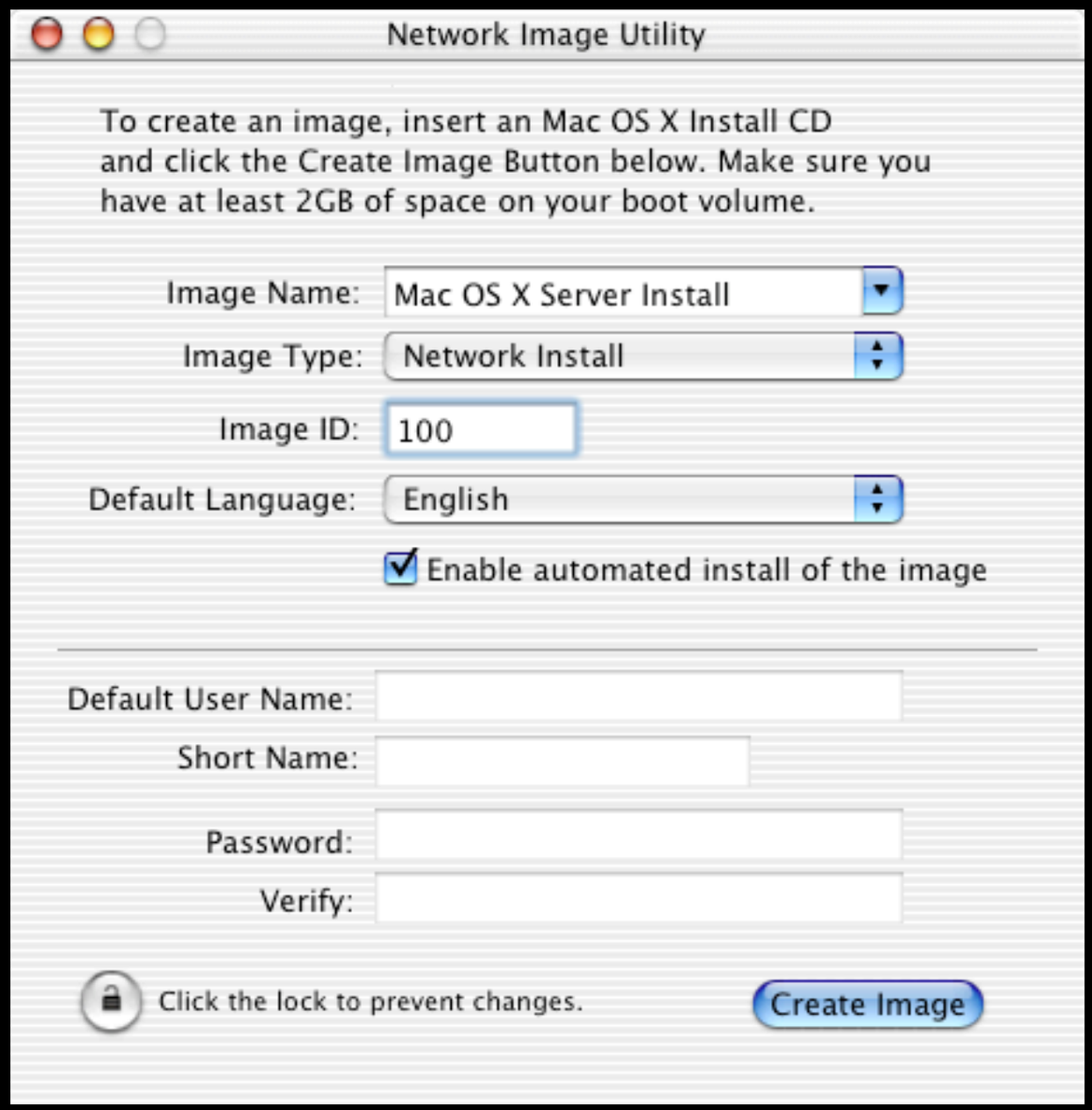


Deployment
Software installation

- Network install
  - Create a Mac OS X Server install image using Network Image Utility
    - Recommend using NIU 10.2.5 or later
  - Place image on NetBoot server and make image active
  - Boot server from install image
    - Must be default image for front panel mode or “N” key to choose automatically

Network Image Utility

Image creation



Deployment
Software installation

- Clone system disk using `asr`
  - Drive bay to drive bay in Xserve

```
% /usr/sbin/asr -source <volume> -target <volume>
-erase -verbose -debug
```

  - From web server

```
% /usr/sbin/asr -source http://<IP address>/<path to
disk image> -target <volume> -erase -verbose -debug
```

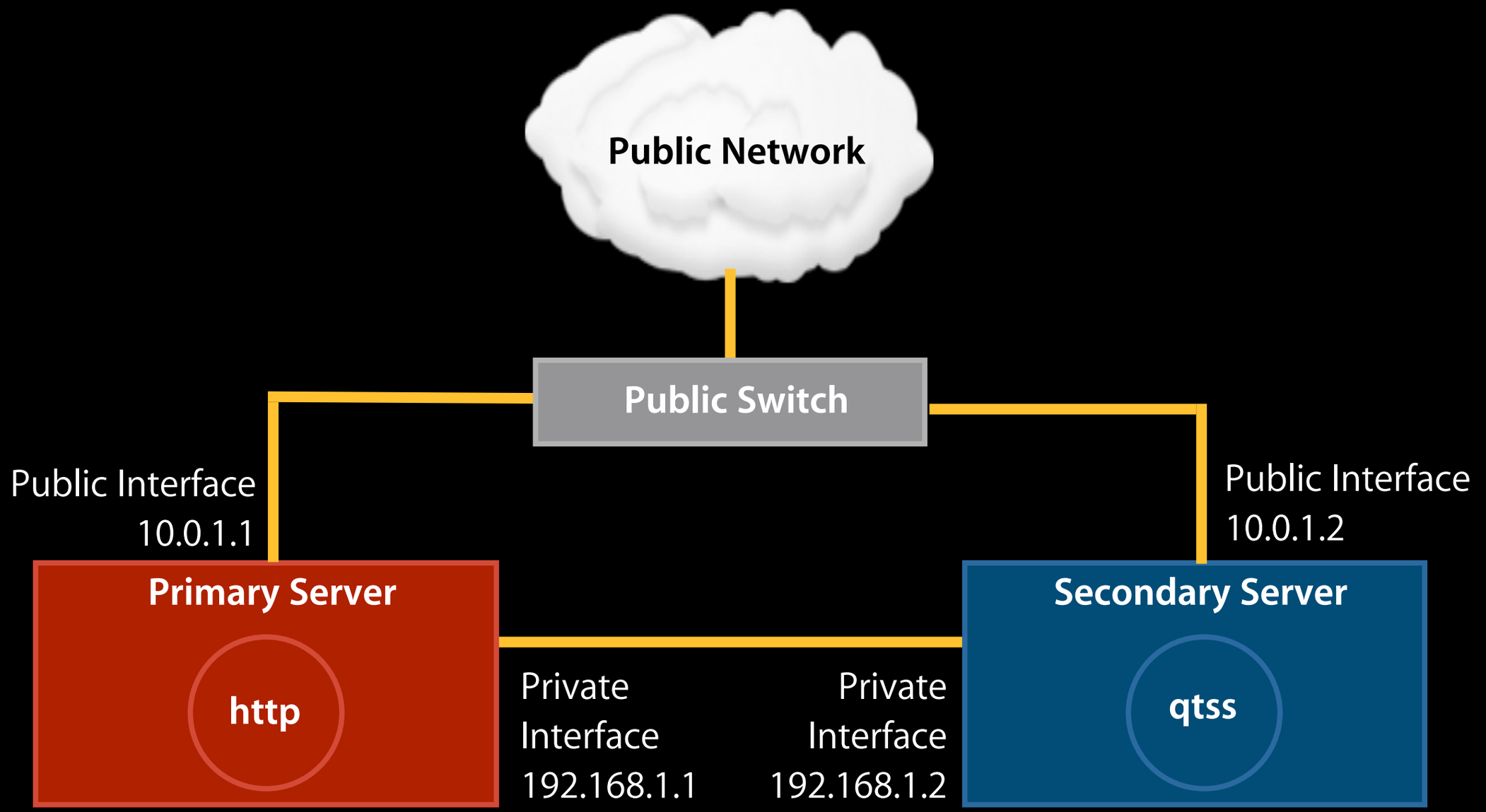
Deployment

IP Failover

- Script-drive architecture for two-node high availability
- Built into Jaguar Server
- Requires heartbeat between two servers
  - Ideal for IP over FireWire
- Failover and fail back
- Ideal for static services
- Does not replicate data

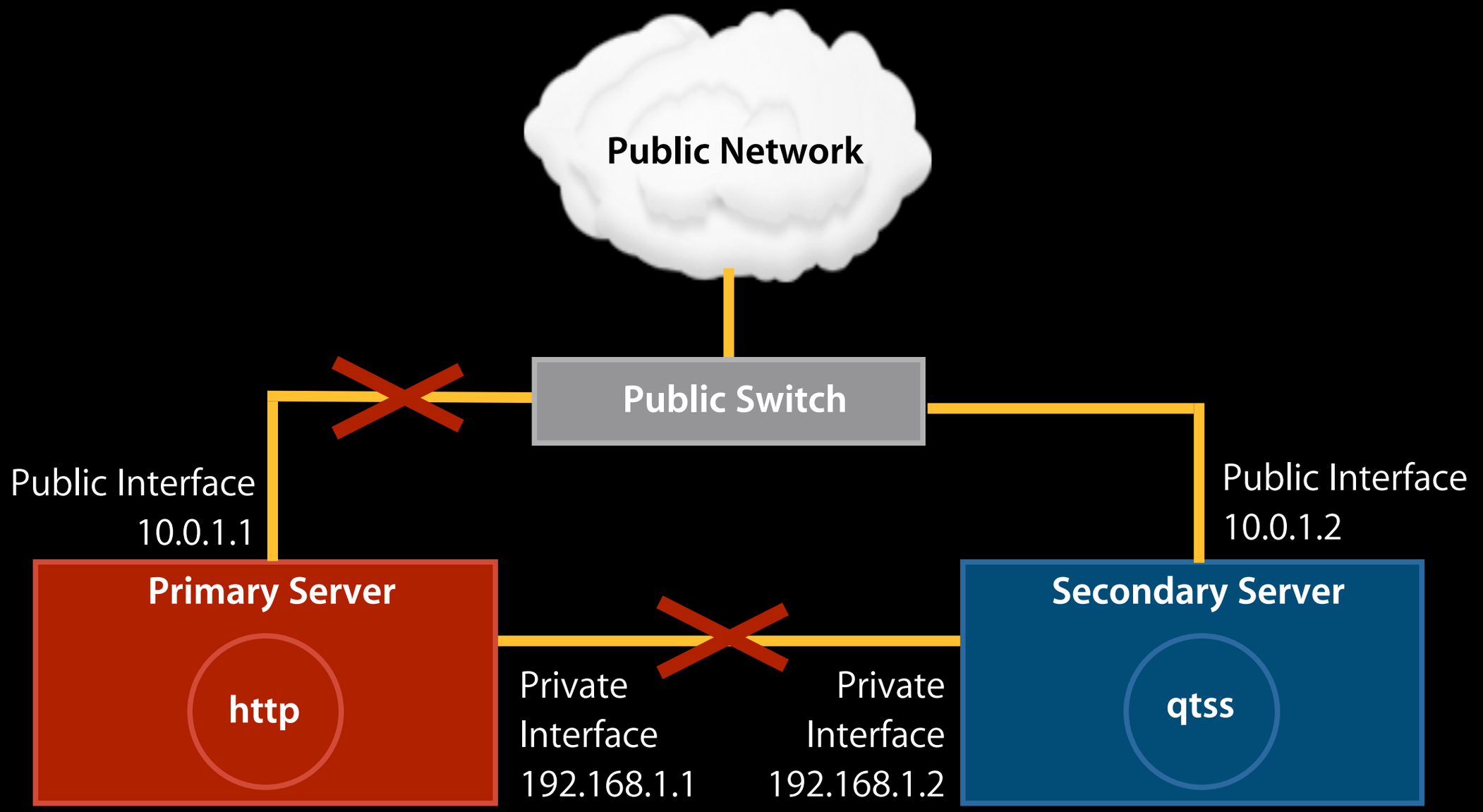
IP Failover

Architecture



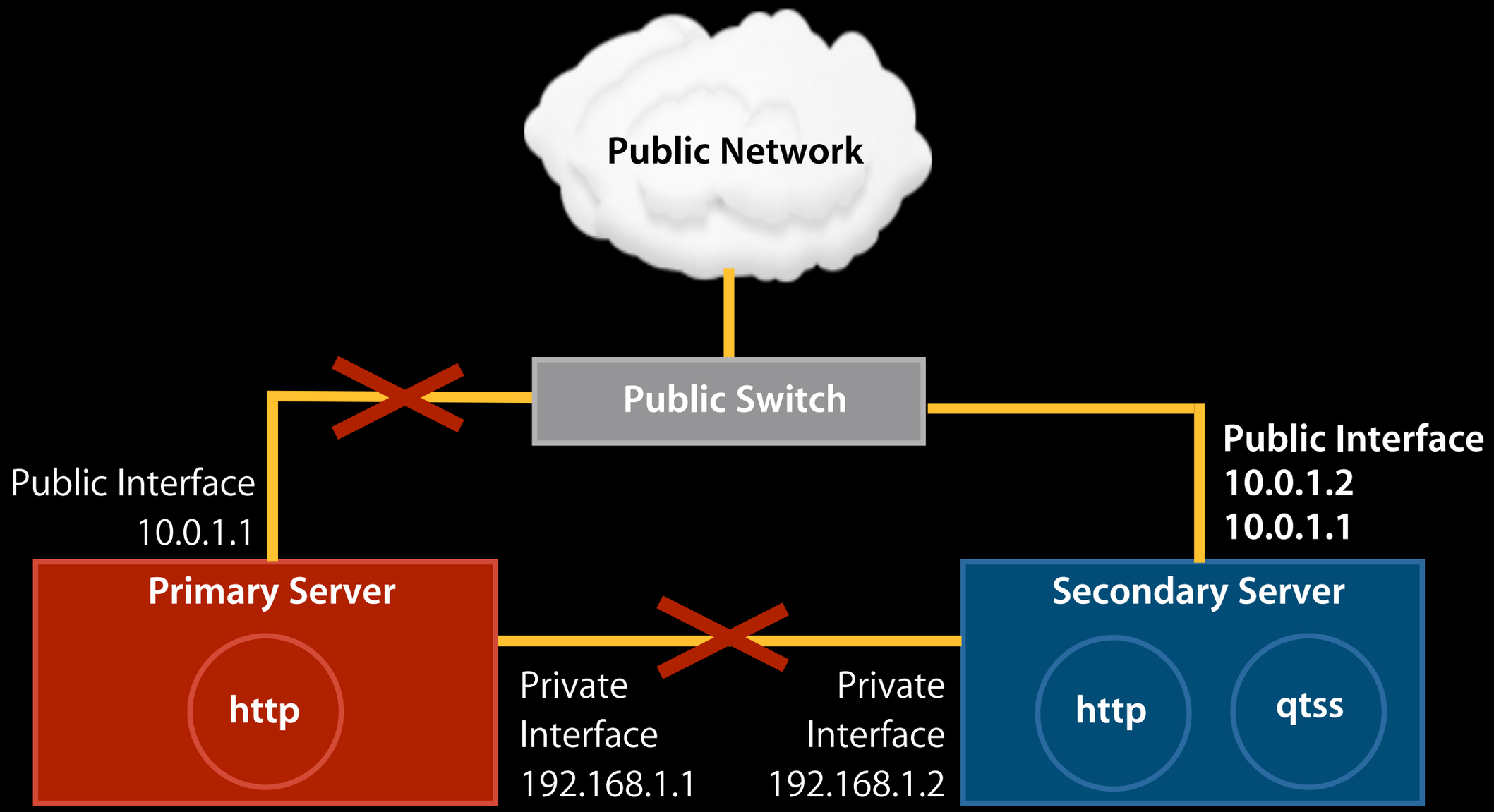
IP Failover

Architecture



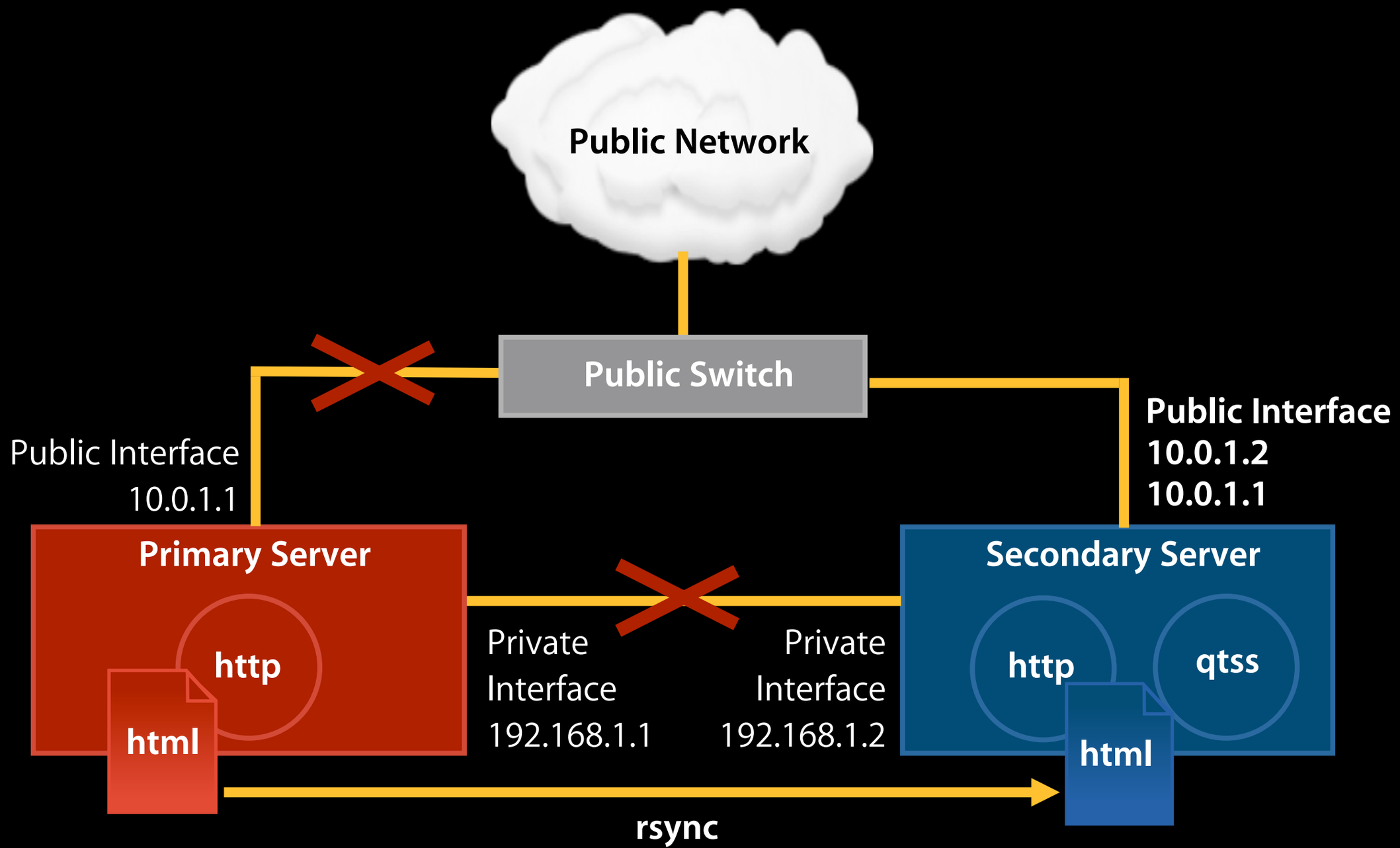
IP Failover

Architecture



IP Failover

Architecture



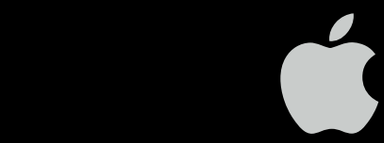
Deployment
IP Failover

- Does not replicate data
  - Use rsync or other replication tools to sync content
- Can run pre and post acquire scripts to customize behavior
  - Terminate non-essential processes
  - Nice lower priority services
- Failover and fail back

Deployment

Beyond IP Failover

- Many applications handle their own service-level failover
  - Stalker's CommuniGate mail server
- Software or hardware load balancers for scale-out applications
- Astera's Rhino Fiber Channel cards provide scriptable LUN masking for Fiber Channel storage



Backup Strategies

- Backup challenges
  - More data online
  - More data “churn”
  - Backup windows shrinking
  - Tape not keeping up with disk speed and capacity
- RAID is not backup

Backup Strategies

Solutions available today on Mac OS X

- Dantz Retrospect
- Clients for:
  - Arkeia
  - Legato Networker
  - Teradactyl Tibs
  - Tivoli TSM
  - Veritas NetBackup
- TOLIS Group's BRU

Backup Strategies

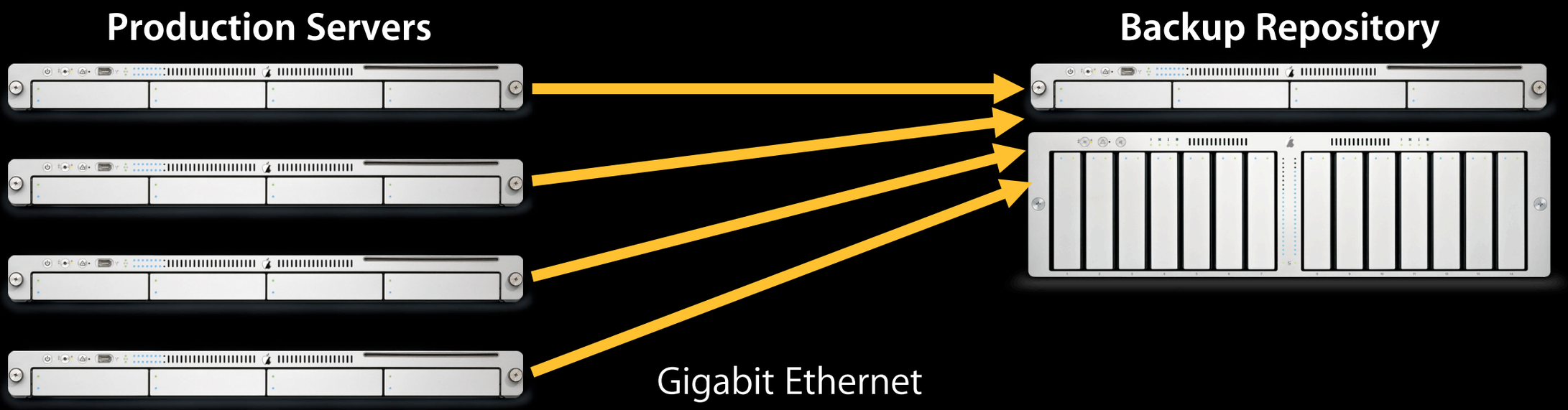
Solutions available today on Mac OS X

- TOLIS Group's BRU
  - Can drive multiple tape heads concurrently
  - Can drive tape libraries
  - Can backup over any available I/O channel
    - USB
    - FireWire
    - SCSI
    - Fibre Channel

Backup Strategies

Disk to disk backup

- Massive storage capacity of Xserve and Xserve RAID ideal for backup



Backup Strategies

Disk to disk backup

- Massive storage capacity of Xserve and Xserve RAID ideal for backup

Beyond the GUI

Essential Mac OS X command line tools

- System configuration tools
  - `networksetup`
    - CLI equivalent to Network preference's pane
  - `systemsetup`
    - CLI equivalent to many other system preferences
      - Time, date, timezone
      - Sleep
      - Startup disk
      - Computer name

Beyond the GUI

Essential Mac OS X command line tools

- System management tools
  - `diskutil`
    - CLI access to Disk Utility.app
  - `dsimportexport`
  - `createhomedir`
  - `snmpconf`
  - `diskspacemonitor`

Beyond the GUI

Essential Mac OS X command line tools

- Installation and Update tools
  - `softwareupdate`
  - `diskKeyFinder`
  - `installer`
  - `asr`

Deploying Xserve

Summary

- IT faced with continual challenges
- Xserve and Mac OS X Server can make server deployment
  - Faster
  - Cheaper
  - Easier

Panther Server

More capabilities, even easier to deploy

- Improved performance and scalability
- Automatic setup and remote software installation
- BSD 5
- Case sensitive HFS+ file system
- Server Admin
- Open Directory 2.0
- Single sign-on
- Ethernet speed and duplex settings
- …and much, much more!

Wrap Up

Enterprise IT Roadmap

600 Apple Solutions in the Enterprise Learn how Apple's solutions fit into the Enterprise	**The Mission** **Mon, 3:30pm**
604 Mac OS X Server Overview Mac OS X Server strategy and upcoming features	**The Mission** **Tue, 2:00pm**
606 Mac OS X Server in Depth Learn the system capabilities of Mac OS X Server	**The Marina** **Tue, 3:30pm**
615 Building Computational Clusters Building clusters for high performance computing	**Pacific Heights** **Wed, 3:30pm**
621 Deploying Xserve RAID What it takes to plan and manage deployment	**Russian Hill** **Thu, 3:30pm**

Developer and Core OS Roadmap

301 Apple Tools for the UNIX Developer

Command line development capabilities of Mac OS X

Russian Hill
Tue, 9:00am

102 Open Source at Apple

Update on Apple's Open Source projects

The Mission
Tue, 10:30am

108 Kerberos in Mac OS X

Learn about Apple's use of Kerberos in Mac OS X

The Mission
Thu, 9:00am

Who to Contact

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http://developer.apple.com/wwdc2003/urls.html

For More Information

References

Xserve

Xserve, Xserve RAID and Mac OS X Server
http://www.apple.com/server

Mailing Lists

Mac OS X Server
http://www.lists.apple.com/mailman/listinfo/macos-x-server/

Q&A

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WWDC 2003

Worldwide Developers Conference